GE
Measurement & Control

# phoenix datos|x

## Advanced CT software for fully automated data acquisition, reconstruction and volume processing with GE's industrial CT systems
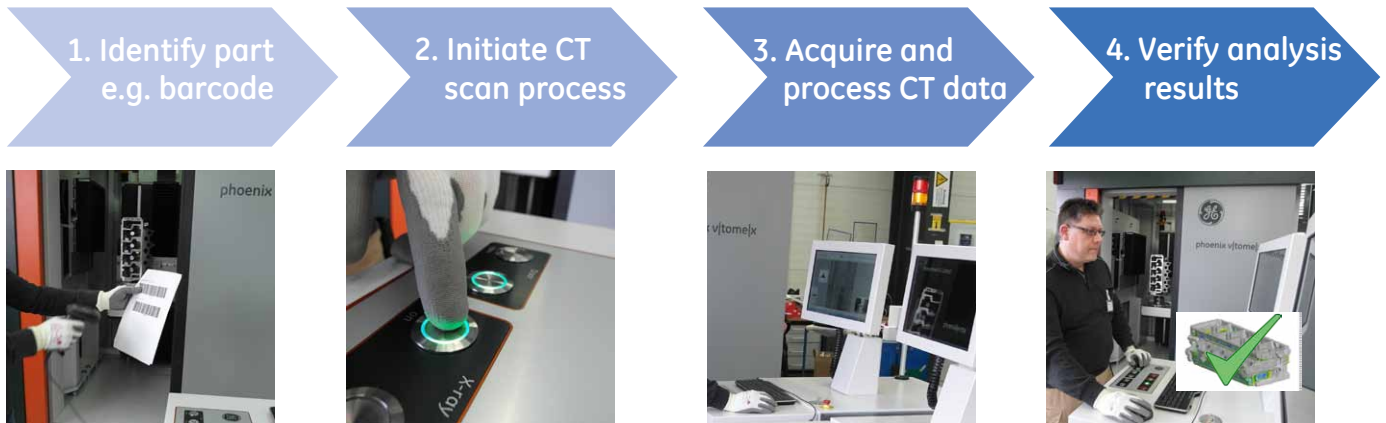
## Key features & benefits

- Up to 14 times faster volume reconstruction for accelerated sample throughput

- Improved automatization functions for highly effective system usage

- CT system performance monitoring following ASTM 1695 guideline

- click & measure|CT functionality for high throughput automated batch CT inspection task execution

- Production mode with one-button|CT functionality and intuitive user interface for improved ease of use

- Supports optional metrology|edition CT system configuration for high precision 3D measurements following VDI 2630 guideline

With phoenix datos|x software, the entire CT process chain can be fully automated. This minimizes operator time and influence, while highly increasing the throughput as well as the repeatability and reproducibility of CT results. 3D failure analysis or 3D metrology tasks like generation of first article inspection reports by 3rd party software products can be executed automatically. datos|x offers also an expert mode for flexible laboratory and research tasks with optimized CT results.

## Workflow optimization for production CT tasks

| 1. Identify part e.g. barcode | 2. Initiate CT scan process | 3. Acquire and process CT data | 4. Verify analysis results |



## Automated acquisition with one-button|CT

### Production mode with highly simplified user interface

• Improved intuitive graphical user interface for easy usage, a fast learning curve and integrated control of the system (X-ray tube, detector, sample manipulator) for setup and start of high quality CT scans

• Process flow orientated function tool bar for step-by-step workflow setup with intuitive user interface
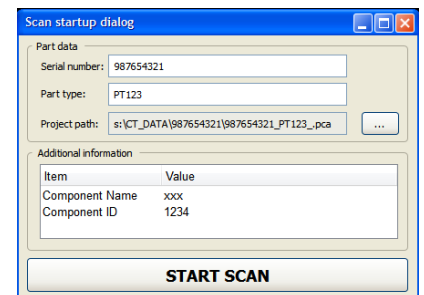
### Support of up to five different user levels

• Password protected user management

• Operator mode: basic features ensures running the system for industrial analysis and metrology tasks with a minimum of user training

• Expert and admin mode: full access to all available functions and parameters for extremely flexible use of the system for scientific research and programming of quality analysis tasks.
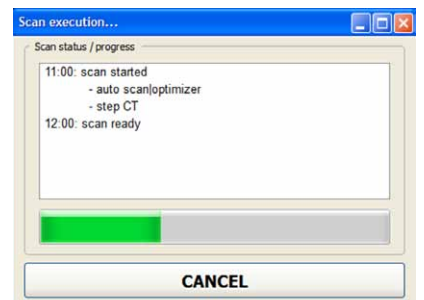
### Automated system calibration functions

System preparation for CT scan (detector calibration, tube conditioning etc.)

### Semi-automated system performance test following ASTM 1695

• New datos|x function for quantitative CT image performance monitoring

• Determination of modular transfer function (spatial resolution) in lp/mm per ASTM 1695

• Determination of contrast discrimination function (contrast sensitivity, inverse of CNR) in %

• Includes report generation

• Allows system performance monitoring



Measurement of sphere distances with a calibrated test specimen and comparison to the calibrated values

## Batch functionality

For automated execution of pre-defined inspection tasks with click & measure|CT enlarges the degree of system usage of up to 20-30%

- „click & measure|CT" functionality: from scan start to displaying and analysis of the 3D results on the screen without manual user interaction in just 3 steps:

    1) **Insert the work piece**
    2) **Start the scan**
    3) **Check results**

- **Complete automation** of the full CT data handling chain (system calibration e.g. tube & detector), data acquisition, volume reconstruction / optimization and CT data processing for pre-defined standard tasks.

- **Automated multi-object scans:** Scan, reconstruct and process different objects with different parameters with just one setup and no further interaction

- **Automated procedures for metrology**, e.g. voxel/calib for high precision determination of FOD/FDD
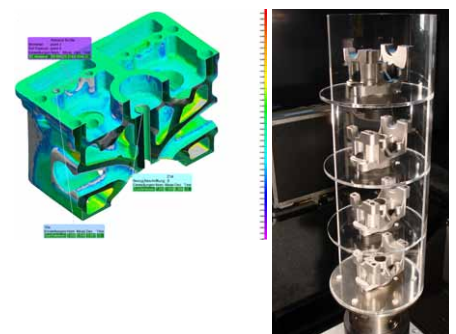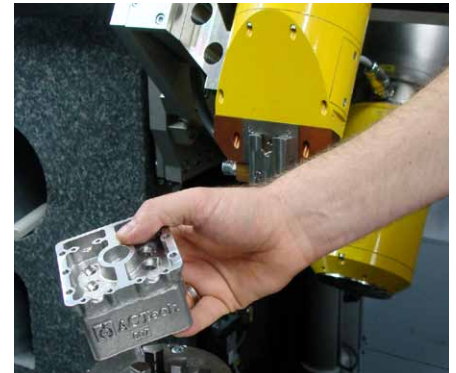
# Automated reconstruction and analysis

- **Multi GPU based volume reconstruction** using velo|CT for up to 14 × faster CT results for accelerated sample throughput without any reconstruction PC cluster required

- **multi|volume** reconstruction for ultra large volume data sets which exceed physical memory

- **Clear display of CT results**: volume visualization in 2D axis views and 3D render mode

- **Reproducible high-resolution CT results** even by unskilled operators after minimal training

- **Wide spectrum of modules** for ease of use and accurate CT results

- Diverse **automatic volume optimization functions** (e.g. filter functions for noise reduction, ring artifact reduction)
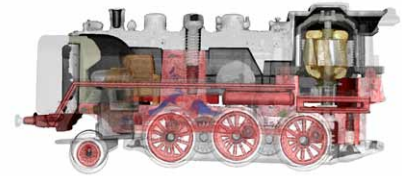
- Automatic generation of **first-article-inspection reports** in < 1 hour possible

- **Interface** to various external software packages for further automatic volume processing (e.g. VGStudio MAX, VSG Avizo, PolyWorks and others) and execution of pre-defined 3D evaluation macros

- **DICONDE CT data export** compliant to the international standard
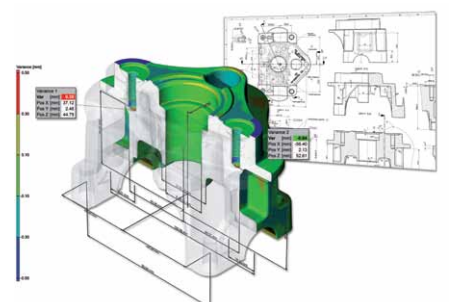
# Features

## Modules and module packages

**Proprietary datos|x CT acquisition and reconstruction software including**:

- click & measure|CT      for completely automated CT process chain including production mode

### datos|x module package "basic":

- agc|module      automated geometry calibration
- bhc+|module      beam hardening correction, automated for one-material samples
- rar|module      automated ring artifact reduction
- auto|roi      automated determination of reconstruction volume

### datos|x module package "advanced" in addition to the "basic" package:

- scan|optimiser      optimization of scans with linear drift effects
- multi|scan      automated acq./rec. of multiscans
- mv|reco      automated piecewise reconstruction of large volumes
- sector|scan      region of interest scans (roi|scan)
- fast|scan      CT scans with continuous sample rotation

**Opt. 3D metrology bundle:**      High accuracy direct measuring system, 2 calibration objects, phoenix datos|x CT software package "metrology"

### datos|x module package "metrology":

- surface|extraction      automated generation of surface data
- easy|calib      module for CT system calibration
- calibration|object      1 calibration tool with certificate

### datos|x module package "click & measure|CT":

- auto|CT & batch|CT      for completely automated CT process chain (e.g. aquisition, reconstruction, execution of modules for data optimization, surface extraction, link to e.g. VGStudio MAX or Avizo, execution of measurement templates)
- one-button|CT      for efficient and simple CT operation (production mode)
- ext|launch      module for execution of external software packages using CMD, JavaScript or python
- DICONDE|export      CT data export in international DICONDE standard format

### Additional modules

- velo|CT      Multi-GPU based reconstruction acceleration for CT results within just a few seconds or minutes, depending on the volume size. Versions: "basic", "speed" and "highspeed" for up to 14 × faster processing than current reconstruction solution
- multi|volume      reconstruction for ultra large volume data sets which exceed physical memory
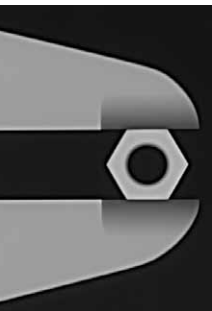
# phoenix datos|x - your benefits

- **CLEAR:** highly improved interface for ease of use and intuitive process flow
- **EFFICIENT:** ultra fast volume reconstruction and decreased CT operator time
- **AUTOMATIC:** one-button|CT batch processing tools for data acquisition, volume reconstruction and 3D analysis
- **FLEXIBLE:** functionality and interfaces for customized CT solutions
- **EASY:** significant reduction of required training and operator time

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